CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF PESTICIDE REGULATION

MEDICAL TOXICOLOGY BRANCH

SUMMARY OF TOXICOLOGY DATA
Mineral Oil - **PETROLEUM OIL (Unclassified)**

Chemical Code: 765, SB 950-297, Tolerance # 50392
Original Review: December 9, 1987
Revised 9/27/88; 7/19/01

I. DATA GAP STATUS

Chronic, rat:	Data gap, no study on file
Chronic, dog:	Data gap, no study on file
Oncogenicity, rat:	Data gap, no study on file
Oncogenicity, mouse:	Data gap, inadequate study, possible adverse effect indicated
Reproduction, rat:	Data gap, no study on file
Teratology, rat:	Data gap, no study on file
Teratology, rabbit:	Data gap, no study on file
Gene mutation:	No data gap, no adverse effect
Chromosomal aberration:	Data gap, inadequate study, no adverse effect indicated
DNA damage:	Data gap, no study on file
Neurotoxicity:	Not required at this time

Note, Toxicology one-liners are attached
** indicates acceptable study.
Bold face indicates possible adverse effect.

File name T010719
Toxicology Summary Revised by: Silva, 9/88; Kishiyama & Silva, 7/19/01

II. TOXICOLOGY SUMMARY

These pages contain summaries only. Individual worksheets may contain additional effects.

CHRONIC, RAT

No study on file.

CHRONIC, DOG

No study on file.

ONCOGENICITY, RAT

No study on file.

ONCOGENICITY, MOUSE

50392 - 011 043985 "Dermal Oncogenicity Studies of MH-982, MH-983, MH-1147, MH-1148, MH-1173, MH-1174, MH-1175, MH-1255 and MH-1256 in Male C3H/HeJ Mice." (Bushy Run Research Center, 10/29/84, Study 79-150) Nine samples were tested, all described as liquids with no further characterization. Registered test article was MH-1255. 50 male mice per group; 25 ul undiluted was applied per mouse to the skin three times per week on Monday, Wednesday and Friday with MH-983 designated as the negative control and MH-982 as the positive control. **Possible adverse effect indicated**: Four of nine samples tested increased tumor formation and decreased the time-to-tumor and mean survival (positives were MH-982, MH-1174, MH-1175 and MH-1256. Registered test article, MH-1255, was **not** one of these four positives); unacceptable (Study was designed as a dermal treatment oncogenicity screening study only: no females included, limited tissues for histopathology, no individual data, no rationale for dose, no indication of percent of body surface involved in application. **The other 8 test products need to be identified**.) Not upgradeable. J. Gee, 12/9/87.

NOTE: Study was negative for the registered product, but positive for 4 of 9 samples tested in the series. The report does not identify the other chemicals, which could be analogs of the registered product. Representative species of generically related petroleum products are expected to be tested on behalf of respective groups to fill data gaps. For this reason, the four positive chemicals are presumed to be representative petroleum products, and a "possible adverse effect" is indicated.

REPRODUCTION, RAT

No study on file.

TERATOLOGY, RAT

No study on file.

TERATOLOGY, RABBIT

No study on file.

GENE MUTATION

50392 - 028 - 114995: Summary of 50792 - 003 - 067197.

50392 - 030 117103, "*Salmonella*/Mammalian Microsome Mutagenicity Test (Ames Test) with Four Samples of Hydrocracked Lube Oil Stocks (Pilot Plant)," (Parker, J.A.; Chevron Environmental Health Center, Inc., Richmond, CA; Laboratory Project ID SOCAL 1827, 6/12/81). Hydrocracked Lube oil stocks PE-2-1 (neutral oil 20), PE-2-2 (neutral oil 40), PE-2-3 (neutral oil 110) and PE-2-4 (Bright Stock 32) were used on *Salmonella typhimurium* strain TA100 at 0 (DMSO), 0.01, 0.10, 1.0, 5.0 and 10.0 mg/plate (+/-S9 Mix) to assay mutagenic potential with and without Aroclor 1254 induced male rat liver activation, in triplicate. Exposure time was for 3 days at 37°C. The number of revertant colonies increased slightly (<2x) with **PE-2-4 at 5 and 10 mg/plate** (with S9 Mix). UNACCEPTABLE and not upgradeable (Not a FIFRA Guideline study. Numerous deficiencies). These data are supplemental. (Kishiyama & Silva, 7/10/01).

50392 - 028 – 114996: Summary of 50392 – 030 117103.

50392 - 030 – 117104: Duplicate of 50792 – 003 067198.

50392 - 028 114988: Summary of 50392 – 030 117104 and 50792 – 003 067198.

50392 - 030 117106 is the same as 50792 – 003 067119, but includes discussion on the evaluation of the other lube oils (DG 2487, DG 2488, DG 2489, BO 1350, BO 1351, BO 1352). No worksheet. (Kishiyama & Silva, 11/17/01).

50392 - 028 114991: Summary of 50792 – 003 067199.

50392 - 030 117106 "The Potential of Four Hydrocracked Lube Oil Stocks and Three RPM Lube Oil Stocks to Mutate Histidine-Deficient Strains *of Salmonella typhimurium*," (Wong, Z.A.; Chevron Environmental Health Center Inc., Richmond, CA; Laboratory Project ID: SOCAL 1753, 12/5/80). Hydrocracked Lube Oil Stocks: DG 2486 Neutral Oil 20 (100), DG 2487 Neutral Oil 40 (200), DG 2488 Neutral Oil 110 (500), DG 2489 Bright Stock 32 (150); RPM Lube Oil Stocks: BO 1350 Chevron Neutral Oil 24 (125), BO 1351 Chevron Neutral Oil 80 (400), BO 1352 Bright Stock 35 (185) were assayed at 0 (DMSO), 0.1, 1.0, or 10 mg/plate and using *Salmonella typhimurim* strains TA98, TA100, TA1535 and TA1537 with and without S9. Exposure time was 2-3 days. **Possible adverse effect indicated: DG 2489 Bright Stock 32, DG 2488 Neutral Oil 110 and BO 1350 Chevron Neutral Oil 24 were reported as weakly mutagenic with TA100 and complete liver S9.** Unacceptable (Not a FIFRA Guideline study. It is not possible to completely evaluate the equivocal results. The test should have been repeated at higher doses to validate the possibility of weak mutagenicity.). (Kishiyama & Silva, 7/11/01).

SUMMARY (based on studies in document #50792): Although study 067198 showed a weak mutagenic response with TA98, it is doubtful that petroleum distillates are point mutagens, based on the overwhelming negative response in the other two tests (067197 & 067199). In fact, the test material was taken to 40 mg/plate and only a weak mutagenic response was observed (twice background). Therefore, petroleum distillates, refined should not be considered to be a point or time-shift mutagen in the Ames test.

50392 - 001 017076 "Salmonella/Mammalian Microsome Mutagenicity (Ames Test) with Chevron Aromatic Oil."(Standard Oil, 10/12/82) Aromatic oil, coded CAO-CWO #1, 55565-2; tested with Salmonella strains TA1535, TA1537, TA1538, TA98 and TA100 at 0, 0.01, 0.03, 0.1, 0.3 and 1.0 mg/plate as a suspension in DMSO; with and without rat liver activation; triplicate plates, single trial

- data presented as the mean ± standard deviation; unacceptable (single trial, no individual plate counts, no justification for amounts of test material used, test article not adequately described.) J. Gee, 7/25/85

50392 - 030 117105 "CHO/HGPRT Test Using Orchard Spray 70," (Goode, J.W., Papciak, R.J.; Gulf Life Sciences Center, Pittsburgh, PA; Laboratory Project ID: 82-073, 9/24/83). Orchard Spray 70 at 0 (F127), 4, 32, 256, 512, 1024 and 2048 µg/ml was evaluated for forward mutations at the HGPRT locus in CHO-K1 Chinese Hamster ovary (CHO) cells with and without Aroclor 1254-induced rat liver activation. After a 5 hour exposure and 8-day expression time, there were no significant changes in mutants/10^6 clonable cells or in cell survival at > 256 µg/ml. Not acceptable or upgradeable (No toxicity was observed, therefore it is not possible to evaluate mutagenic potential at the doses used). (Kishiyama & Silva, 7/11/01).

50392 - 028 114998: Summary of 50392 – 030 117105.

MUTAGENICITY, CHROMOSOMES

50392 - 030 117107 "Micronucleus Test in Mouse Bone Marrow: Gulf 100 Paraffine Oil Administered by Dermal Application for 2 Days," (Harnois, M.C., Kahn, S.H.; Gulf Life Sciences Center, Laboratory Project ID: 82-072, 3/25/83). Gulf 100 Paraffine Oil was administered dermally at 0 (corn oil), 625, 1250, 2500 or 5000 mg/kg (limit test) to Crl:CD®-1 (ICR) BR Swiss mice (10/sex/dose) for 2 days. The animals were sacrificed and bone marrow smears were prepared on days 3 and 4, except rats treated with cyclophosphamide (positive control, applied by ip injection) were sacrificed only on day 3. Slides were stained on the day following preparation. No test article related effects reported. UNACCEPTABLE (Insufficient information). (Kishiyama & Silva, 7/12/01).

50392 - 028 115002: Summary of 50392 – 030 117107.

50392 – 028 114997: Summary of 50392 – 030 117102.

50392 - 030 117108 "Micronucleus Test in Mouse Bone Marrow: Orchard Spray 70," (Harnois, M.C., Kahn, S.H;.Gulf Life Sciences Center, Pittsburgh, PA; Laboratory Project ID: 82-052, 2/21/83). Orchard Spray 70 was administered by gavage at 0 (corn oil), 1643, 4105, 8218 or 16817 mg/kg to Crl:CD®-1 (ICR) BR Swiss mice (3/sex/group) for 2 days. The number of micronucleated polychromatic erythrocytes was not significantly increased with Orchard Spray 70 treatments. Not acceptable or upgradeable (no analysis of dosing solution; more protocol information was necessary). (Kishiyama & Silva, 7/12/01).

50392 - 028 115001: Summary of 50392 – 030 117109.

50392 - 030 117102 "Range-Finding Test for the Micronucleus Test: Gulf 100 Paraffine Oil Administered by Gavage for 2 Days," (Harnois, M.C.; Gulf Life Sciences Center; Laboratory Project ID: 82-026, 11/9/82). Gulf 100 Paraffine Oil was administered to Crl:CD-1 (ICR) BR Swiss mice (3/sex/dose) by gavage at 0 (corn oil), 98, 451, 823, 4224 or 8335 mg/kg for 2 days. All mice were terminated 24 hours after the last dose. One femur was removed and the bone marrow was examined. The high dose of 8335 mg/kg did not significantly effect the ratio of polychromatic to normochromatic erythrocytes nor indicate cytotoxicity. **NOEL** >8335 mg/kg (No significant

treatment-related effects occurred at any dose. Unacceptable (Not a FIFRA Guideline study.) Data are supplemental. (Kishiyama & Silva, 7/9/01).

MUTAGENICITY, DNA/OTHER

No study on file.

NEUROTOXICITY

Not required at this time.

MISCELLANEOUS STUDIES:

Subchronic, Rat

50392 - 029 117096 "Five-Day Repeated Dose Dermal Toxicity Study in Rats of Light Neutral Oil," (Zellers, J.E., Meckley, D.R.; Gulf Life Sciences Center, Laboratory Project ID#: 1184, 4/12/84). Light Neutral Oil, applied dermally at 0 (Heavy Paraffin Oil), 1.0 (diluted, 42.5% w/v), 1.0 (undiluted) and 2.0 (undiluted) g/kg to Fischer 344 rats (5/sex/dose) for 5 days. Volumes were 2.36, 2.36, 1.18, 2.36 ml/kg, control through high dose. The method of application was not described. Food consumption decrease was dose related and most apparent (reduced 8.3%) for the high dose group. No skin effects were reported. UNACCEPTABLE (Not a FIFRA Guideline study: major variances and insufficient information). No adverse effect indicated. These data are supplemental. (Kishiyama & Silva, 6/6/01).

50392 - 028 114978: Summary of 50392 – 029 117096.

50392 - 029 117099 "Five-Day Repeated Dose Inhalation Toxicity Study in Rats of Neutral Light Oil," (Goode, J.W., Patrick, D.L.; Gulf Life Sciences Center, Pittsburgh, PA; Laboratory Project ID: 1185, 7/2/84). Neutral Light Oil technical was used via whole-body inhalation on Fischer 344 rats (5/sex/dose) at target doses of 0, 0.5, 1.5 and 3.0 g/m^3 (analytical concentrations of 0, 0.54, 1.7 and 2.97 g/m^3) for five 6-hour/day exposure periods. NOEL = 0.50 g/m^3 (2 females at 3 g/m^3 died (days 2 & 4) on study (considered treatment related). Body weights were lower (12%) on study day 5 for females at 3 g/m^3. Most treated rats had discolored hair. Both sexes at $\geq$ 1.5 g/m^3 appeared unkempt (porphyrin eyes, perianal soiling, nasal discharge, red material around the mouth & nose). Lung tissues from 3 rats (1 male, 3 g/m^3 & 2 females, 1.5 g/m^3) had significant signs of lung irritation.) Not acceptable or upgradeable (not a FIFRA Guideline study; major variances and insufficient information). These data are supplemental. Possible adverse effects indicated (increased mortality, respiratory distress) (Kishiyama & Silva, 6/13/01).

50392 - 028 114987: Summary of 50392 - 029 117099.

50392 - 030 117101 "Nine-Day Repeated Dose Inhalation Toxicity Study in Rats -Orchard Spray 70," (Gordon, T., Steele, F.; Gulf Life Sciences Center, Pittsburgh, PA; Laboratory ID #: 82-064; 9/15/83). Fischer 344 rats (5/sex/dose) were exposed via inhalation to Orchard Spray 70 at 0, 1 and 1.5 g/m^3 for 6 hours/day, 5 days/week (9 days, 5 days/week). **NOEL** <0.5 g/m^3 (One female death at 1.5 g/m^3 was considered to be treatment-related. Initial, but transient weight decreases occurred in females at 1.5 g/m^3. Changes in the lungs consisted of congestion, edema, with hypertrophy and hyperplasia of alveolar macrophages at 1.5 g/m^3. Clinical changes occurred in both sexes at = 0.5

g/m^3 and included closed eyes, ocular porphyria and nasal discharge. Possible adverse effects indicated (severe lung damage, death). UNACCEPTABLE (Not a FIFRA Guideline study; major variances). (Kishiyama & Silva, 7/2/01).

50392 - 030 117100 "Four-Week Repeated Dose Inhalation Toxicity Study in Rats of Light Neutral Oil", (Goode, J. W., Patrick, D.L.; Chevron Environmental Health Center, Inc., Richmond, CA; Laboratory Project ID: 1187, 11/16/84). Light Neutral Oil was used on Fischer 344 rats (10/sex/dose), exposed by inhalation at 0, 0.5, 0.75 or 1.5 g/m^3 for a total of 20 exposures (6-hour/day) over 28 days. NOEL < 0.5 gm^3 (Body weights were statistically significantly decreased in males at = 0.75 g/m^3. The highest daily incidence of test material on fur, dry red material around mouth and/or nose, clear nasal discharge, and ocular porphyrin and discharge was observed at 1.5 g/m^3, but found at all doses. Increased circulating white blood cells with a relative increase in neutrophils were observed in males at = 0.5 g/m^3 and in females at 1.5 g/m^3. Absolute and relative spleen weights were increased in females at 1.5 g/m^3. The absolute and relative liver weights were increased in females at = 0.5 g/m^3. Absolute and relative lung weights were increased in both sexes at = 0.5 g/m^3. Light neutral oil at all dosages caused hyperplasia of alveolar macrophages in the lung of all test animals. Granulomatous pneumonitis was present in both sexes at 1.5 g/m^3 and in 4 females at 0.75 g/m^3. Granulomatous hepatitis in the liver occurred in females at 1.5 g/m^3. Mononuclear inflammation to nasal turbinates was observed in both sexes at 1.5 g/m^3.) Not acceptable (Not a FIFRA Guideline study: major variances and insufficient information). No adverse effect indicated. These data are supplemental. (Kishiyama & Silva, 6/14/01).

50392 - 028 114983: Summary of 50392 – 030 117101.

Subchronic, Rabbit

50392 - 029 117097 "Two-Week Repeated Dose Toxicity Study in Rabbits Using Gulf Orchard Spray 70", (Zellers, J.E., Crutchfield, D.T.; Gulf Life Sciences Center, Houston, TX; Laboratory Project ID #: 82-046, 6/15/83). Gulf Orchard Spray 70 at 0 (corn oil), 1 (43.1% w/v in corn oil) and 2 g/kg (86.18% w/v undiluted) was applied dermally (with occlusion, unabraded skin; 6-hrs/day, 5 d/wk; 2-wks, 10 treatments) to New Zealand White rabbits (3/sex/dose at 0 & 1 g/kg and 6/sex at 2 g/kg). Half the rabbits/sex at 2 g/kg were sacrificed 24 hours after the last treatment. The remaining half at 2 g/kg was observed for an additional 2 weeks (recovery) prior to sacrifice. NOEL < 1.0 g/kg (There was occasional erythema and edema at 1.0 g/kg, more frequent erythema and/or edema and desquamation at 2.0 g/kg occurred. Incidence of acanthosis and hyperkeratosis increased (especially in females at 2 g/kg). Acanthosis was observed in 1 control and 3 females at 2 g/kg. Hyperkeratosis was observed in the same control and all 6 females at 2 g/kg. The severity of acanthosis and hyperkeratosis was considered moderate, except for the minimal to slight hyperkeratosis in 3 females at 2 g/kg. After 2 weeks of recovery, edema and erythema were no longer visible; however, desquamation persisted (1/3 males and 2/3 females). Possible adverse effect indicated (persistent dermal effects after the 2-week recovery period.) UNACCEPTABLE. (Not a FIFRA Guideline study: major variances; insufficient data). These data are supplemental. (Kishiyama & Silva, 6/7/01).

50392 - 028 114977: Summary of 50392 – 029 117097.

50392 - 029 117098, "Two-Week Repeated Dose Toxicity Study in Rabbits Using 100 Paraffine Oil", (Zellers, J.E., Whaley, C.J.; Gulf Life Sciences Center, Pittsburgh, PA; Laboratory Project ID

82-039, 11/15/83). 100 Paraffin Oil, at 0 (corn oil), 1 (diluted/44.3%) and 2 (undiluted) g/kg was applied to unabraded skin, with occlusion (6-hours/day, 5 days/week, 2-weeks) to New Zealand White rabbits (3/sex/dose) with 3/sex for a 2 week recovery period at 2 g/kg. Dosing volume was 2.258 ml/kg for all groups. NOEL < 1 g/kg. Edema, erythema and desquamation showed a dose-related increase in both sexes. A microscopic examination was performed on the skin of 3 control and 6 high dose animal/sex and the incidence of acanthosis and hyperkeratosis was significantly greater at 2 g/kg (100%). After the 2-week recovery period, erythema and edema were greatly reduced in both sexes.) Not acceptable or upgradeable (Not a FIFRA Guideline study.). No adverse effect indicated. (Kishiyama & Silva, 6/11/01).

50392 - 028 114981: Summary of 50392 – 029 117098.

Subchronic, Mice

50392 - 029 117098, "Two-Week Repeated Dose Toxicity Study in Rabbits Using 100 Paraffine Oil", (Zellers, J.E., Whaley, C.J.; Gulf Life Sciences Center, Pittsburgh, PA; Laboratory Project ID 82-039, 11/15/83). 100 Paraffin Oil, at 0 (corn oil), 1 (diluted/44.3%) and 2 (undiluted) g/kg was applied to unabraded skin, with occlusion (6-hours/day, 5 days/week, 2-weeks) to New Zealand White rabbits (3/sex/dose), with 3/sex for a 2 week recovery period at 2 g/kg. Dosing volume was 2.258 ml/kg for all groups. NOEL < 1 g/kg (Edema, erythema and desquamation occurred with a dose-related increase in both sexes. A microscopic examination was performed on the skin of 3 control and 6 high dose animal/sex and the incidence of acanthosis and hyperkeratosis was significantly greater at 2 g/kg (100%). After the 2-week recovery period, erythema and edema were greatly reduced in both sexes.) Not acceptable or upgradeable (Not a FIFRA Guideline study.). **Possible adverse effect indicated (increased skin irritation).** (Kishiyama & Silva, 6/11/01).

50392 - 028 114979: Summary of 50392 – 029 117165.